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ABSTRACT

This paper reports on an analysis of some manifest, surface and verbal characteristics of the classroom behaviors of students and teachers in the first, sixth, and eleventh grades of urban Missouri schools selected for their composition relative to black and white population. Findings indicate that: (1) on the average verbal participation by students increased from the first grade to the sixth grade, but decreased from the sixth grade to the eleventh grade; (2) similar results were found for the average length of individual student utterances; (3) the percentage and length of group responses decreased with increasing grade level; (4) students in first and sixth grade lower class classrooms said less overall and had shorter utterances than did students for those grades in middle class classrooms; (5) in contrast, black eleventh grade students said more and at greater length than did white eleventh grade students; (6) for first and sixth grades, fewer multi-person responses occurred in the middle class classrooms than in the lower class ones; and (7) in these two grade levels, teachers in the lower class classrooms showed less lexical diversity than teachers in corresponding middle class classrooms. (Author/TA)

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Manifest Characteristics of Interactive Sequencing in the Classroom*

by

Daniel G. Hays
Robert N. Kantor
Lawrence Goldstein

Center for Research in Social Behavior
University of Missouri--Columbia

*A number of persons were involved in development of data preparation, evaluation, and computational procedures reflected in this paper, and in analyses reported. That data preparation procedures used here exist at all is due to Harriett Nutt Hays, and her contributions to all other phases of the investigation were invaluable. Robert Kantor, University of Missouri--Columbia, and Lawrence Goldstein, Massachusetts Institute of Technology, were heavily involved in computer program development. Louisa Booth Noble, sociologist, Rachel Moag, linguist, and Timothy Malaney, pre-veterinary medicine student, were among the early post-editors who were particularly helpful in the development of post-editing procedures. Among others who assisted were Irving Chanin, Fred Marcus, and Philip Obley. The analyses reported here were supported by National Science Foundation, Grant No. GS 3232 and by Institutional Research funds to the Center for Research in Social Behavior at the University of Missouri, Columbia, Missouri.

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Manifest Characteristics of Interactive Sequencing in the Classroom

This paper reports the analysis of some manifest, surface, verbal characteristics--including some sequential properties of interaction--of the classroom behaviors of the students and teacher of 1st, 6th, and 11th grades in certain urban Missouri schools selected for their composition relative to black and white population. These tabulations were drawn from careful transcripts (transliteration of utterances plus behavioral description notations) which were prepared for a portion of the videotape "pool" characterized generally in Biddle and Loflin (1971). Most of the analysis was done with a computer, utilizing, of necessity, specially constructed and original programs described here or in D. Hays (1971) which operated directly on graphic language materials, the annotated transliterations of the classroom utterances.

It should be noted that both the basic data and the tabulations reported in this paper differ markedly from those in the other reports included in this series. The data used by Barron (1971), Guyette et al., (1971), Keyes and Loflin (1971), Loflin, Guyette and Biddle (1971), and Marlin and Barron (1971) are drawn primarily from analyses of a "reconstruction" of classroom verbal behavior into a form representing some of the syntax and semantic information judged to underlie the surface verbalizations. The data for this paper are drawn primarily from the actual raw surface verbal materials transliterated as accurately as possible and annotated sparsely for features relevant to the more manifest aspects of the behavioral situation. The "reconstruction" data represent entirely precoded materials. The "transcription" data of this paper represent some materials that are coded in the sense that the annotations were systematic, combined with the uncoded, raw (though transliterated) verbal utterances of the informants.

Discussions below will serve to illustrate similarities and differences resulting from these two approaches; as well as to indicate some of the possibilities for the analysis of social interaction on the level of manifest behavior. Both "transcription" and "reconstruction" examinations revealed differences among classrooms, some of them similar and expected, some not. Some of this variation was tied to variations in positive identification of identifying features of individual participants or utterances, a matter that will be discussed further below.

Assumptions

Based on general considerations involving language and social development as well as tendencies towards uniformity in U. S. public schools, it was expected that:

> Grade level provides a major source of differences both in language behavior and in interaction patterns, irrespective of class composition.

That is, first grade classes would resemble other first grade classes more closely than they would resemble sixth or eleventh grade classes, and so on. It was further conjectured that language behavior in first grade classes would differ more from sixth grade classes than sixth grade classes would differ from eleventh grade classes, because of the relatively young age and the school socialization level of first graders.

Lessons examined were largely in primarily black lower-class and primarily white middle-class classrooms. With respect to this division, it was assumed that:

> Differences between black lower-class and white middle-class classrooms are more pronounced in the early grades than in the later grades.

In part, this assumption was based on considerations regarding general rate of development of language behavior and other social behavior, and from the existential hypothesis that in ordinary American public schoolrooms, both language forms and general social forms are likely to be more foreign to young black students (or similar groups) than they are to white middle-class students. But by the time a student reaches the sixth or the eleventh grade, he has had massive exposure to the social forms of the classroom and the kind of language spoken there, regardless of his cultural place of origin. If he has real problems with the social forms or the language patterns of the classroom he may never reach a sixth or an eleventh grade classroom.

As something of a cautionary hypothesis it was also assumed that:

> Differences in overall discourse format (e.g., lecture presentations, group discussion, etc.) and other situational factors may affect results of interaction analysis in possibly unanticipated ways.

Data Selection and Preparation

Sample

The transcripts of lessons and segments of lessons used here were prepared from the set of classroom videotapes described generally in Biddle and Loflin (1971). Included are six lessons from the set of middle-class white classrooms (Corpus X), and nine lessons from the classrooms which were predominantly lower-class and black (Corpus Y). For this paper, two each of first, sixth, and eleventh grade social studies lessons were chosen from Corpus X. A similar selection from Corpus Y was made, but augmented with a first grade reading and discussion lesson, a sixth grade language arts lesson, and an additional eleventh grade social studies lesson.

For reference to the reconstruction reports: except for three additional Corpus Y lessons listed above, the lessons were the same as those used in Barron (1971). Guyette et al. (1971) used these same twelve lessons in their fifteen-lesson sample, adding additional sixth and eleventh grade lessons, as did Keyes and Loflin (1971).

For Corpus X, post-edited transcripts were available only for ten-minute segments of each lesson, corresponding to the amount of those lessons which had been reconstructed. For Corpus Y, full lesson transcripts were available for all but one (Lesson H). For some analyses reported here, full lesson transcripts were used when available; in other analyses, approximate ten-minute segments were used, for comparison purposes. The ten-minute segments from Corpus Y transcripts which were chosen for this paper were not necessarily the same as the ten-minute segments of those same lessons chosen for reconstruction, results for which are reported in other papers. For this report, when ten-minute segments were used from Corpus Y, they were always the first ten-minutes of a class after obvious preliminaries were over (taking roll, collecting papers from a previous lesson, etc.). Impressionistically, these segments appear to be representative of the kind of interaction in the full lesson transcripts, and figures for average length of actor block, and proportion of student, teacher, and multi-person verbalization for these segments were almost identical to those from the full transcripts, providing evidence that the segments were representative.

Wherever possible, however, full lesson transcripts were the basis of calculated indices.

For most of the results reported below in the section on sequential phenomena, the sample consisted of the four first grade social studies lessons. These transcripts were analyzed in some detail because of an interest in differential behavior patterns in the early grades.

Transcript Preparation

Working from videotapes of classroom sessions, transcriptions into standard orthography were made of all audible classroom utterances. Various supportive information was included in the transcripts: in all cases, an attempt was made to identify speakers; other information, such as manner of speaking, or notable non-verbal events were sometimes included as well.

The preparation of a transcript representing the spoken language and related information in an electronic recording of a situation is not a simple matter, if it is desired that the transcript be anywhere near accurate. H. Hays has shown (1970a, 1971a) that there may be a remarkable number of inconsistencies among different transcribers of the same verbal event, even after repeated examination of the recording. Because of this problem, which is usually simply ignored in behavioral research involving transcripts, an extensive procedure of careful initial transcription and repeated post-editings (comparison of the transcript against the recording) by trained personnel was used for the transcripts analyzed here.

Procedures. Original transcriptions were made by secretarial personnel, following procedures given in H. Hays (1969). Videotapes were played back on an Ampex tape deck, through a Conrac monitor and Koss Pro-4 headphones. The deck transport mechanism was attached to a foot-operated remote control which allowed tape rewind of varying length, and repeated playback. Two audio channels were available, and could be selected singly or both at once; usually one channel was reserved for teacher comments from the microphone about her neck, and the other had signals from overhead omnidirectional microphones suspended from the ceiling of the classroom. Details of recording equipment and techniques are essentially the same as those reported in Biddle and Adams (1970). Transcriptions were typed triple-space, to allow room for subsequent additions and corrections.

When a stretch of utterance was not clearly discernible, transcribers were instructed to leave blanks, or indicate doubt about what they transcribed.

Post-editing procedures, together with conventions for noting non-wordal information (pauses, targets of communications, notable non-verbal events, etc.) which were used for most Corpus Y lessons, are given in Hays and Hays (1969). Procedures used for Corpus X tapes, and a few Corpus Y lessons, are given in Loflin and Barron (1970). In either case, the videotapes were gone over repeatedly and compared against the transcript, by a trained post-editor who showed some talent for the task. All lesson transcripts in the first set were post-edited at least twice, and most at least three times. An examination of records kept for these lessons by H. Hays indicates that transcription time was about 10 times videotape time, and that post-editing time was generally at least two and a half times again as long--and often longer. Similar statistics are not available for lesson transcripts in the second set, but our experience is that in general, careful post-editing is tedious, difficult, time-consuming, and essential.

After ordinary post-editing had been completed, a final stage of human preparation of the texts, called machine convention editing, was performed by the transcription team in order to give a final check to transcripts, the text and annotations of which were to be processed by computer. Consistency in the use of conventions is essential for machine processing. The forms "okay" and "ok", for instance, may mean the same thing to a human being, but they would be treated as different words by a computer unless an extensive table of equivalent forms and likely misspellings were provided for consultation. Similarly, if sentence boundaries need be differentiated by certain punctuation marks, care must be taken that each sentence ends with an appropriate boundary mark and that these marks occur nowhere else as other punctuation or code. Conventions for annotations and other special information must also be checked for consistency.

During machine convention editing it was necessary to adjust the transcripts for differences in use of conventions between the two post-editing procedures, so that the same computations could be performed on both sets. To some extent this regularization of the texts involved simple though tedious changes. In other cases, the adjustments required were not so simple. A more serious matter, which is illustrative of the sensitivity of what are often regarded as straightforward techniques with respect to substantive implications, was variation in the use of punctuation marks for indicating sentence boundaries, unfinished strings, and pause or ellipsis. Post-editors for the first set of transcripts were instructed to rely primarily on intonational cues for determining sentence completion, sentences "left hanging," pauses and revisions; post-editors from the reconstruction team were instructed to identify sentences primarily on the basis of syntactical well-formedness. These approaches reflected different interests in the phenomena, but led to data records which were not comparable with respect to "sentence" and "partial sentence" boundaries.

Details of machine convention editing are given in D. Hays (1970).

In Figure 0, edited transcriptions of parts of two elementary school lessons are given, in order to illustrate some of the conventions which were present in the transcriptions by the time they were entered into the computer. In order to illustrate a number of conventions in a short space, the texts are partly fictional, and have been changed otherwise to protect the identity of the persons involved. The conventions used are one example of those which are handled by ACTS (an acronym for Activity Code and Text System), the computer system for storage of transcript and similar textual data (D. Hays, 1971) which was originated for these materials.

(T) /TO David/ That would sound alright, wouldn't it.

/TO Class/ +Sally, can you get Dick. /BD Randy raises hand./

/BD Teacher nods to Randy./

(Randy) /TO T/ Not "well", because we, I don't think we know "well".

(T) /TO Class/ +I just was surprised there are two words that would sound alright in there. It's not you though. I'll tell you that. Let's read the last one. /BD Carolyn raises hand./ /BD Woman enters room./

(Carolyn) /TO T/ Spot blank jump.

(T) /TO Carolyn/ Good. It's going to be one of those words isn't it?

/TO Woman/ Can I help you?

(T) /TO Laverne/ +I don't think so.

/TO Class/ Yes, Big Man, oh, /lengthened/ he/s <u>ferocious</u>. He's fierce.

(Mary) Wow.

(T) /TO Class/ He nearly, he nearly tears that cage down. +I like to stand <u>way</u> back from Big Man, though. Alright, what's your favorite animal...

(Joe) /TO T/ /SIM BC/ Tiger.

(---) /student/ /TO T/ /SIM BC/ Zebra. /PR zeeber/

(T) /TO Carolyn/ uh [Carolyn]?

T is an abbreviation for teacher.
TO starts all target annotations. BD is the keyword for a systematic (to be analyzed) behavioral description.
Parentheses surround actor designations.
PR keys a systematic annotation for non-standard pronunciations.
+ sign before a word indicates that it would be capitalized even if it were not starting a graphic sentence.
Square brackets surround possibly confidential information in the spoken text.
SIM indicates overlapping utterances.

Figure 0

Parts of a Transcript of a 1st-Grade Lesson,
as Prepared for Computer Entry

Machine Entry and Initial Processing

After its final editing for consistent use of conventions, each transcript was retyped on an IBM MTST office machine for entry into the computer. (The MTST is essentially a Selectric typewriter connected to a special magnetic tape recording device in such a way that every time the typist strikes a key on the typewriter, a special code is generated on a magnetic tape cartridge. Both characters on the keyboard, and function keys, such as carriage return, back-space, etc., have distinct codes, so that when a typist has finished typing a document, there is enough information on the tape to reproduce the document by playing back the cartridge with the MTST in automatic mode. The MTST cartridge may also be used to enter data into the computer, by means of an IBM 2495 Tape Cartridge Reader. For textual data, MTST cartridges are more convenient in general than are ordinary punchcards, since a wider variety of character symbols may be used, and less bulk is involved. This medium was used for entry of all the transcripts used in this study.)

After input, what we call the "raw MTST image" of each transcript was run through a program which straightens out some technical peculiarities of data prepared on an MTST, arranges it according to the original lineation and tabulation, performs some conversion of special symbols, and otherwise makes it more amenable to further processing. One feature of note in this program is its conversion of underlining to a special string of symbols preceding a word. This convention maintains the information that a word or word-segment was underlined in the text, allows it to be stored compactly and processed sequentially.

After the output of this "transcript image file" was printed out and checked carefully for completeness and accuracy against the final transcript, corrections to the transcript image file were made via a text-editing program and the MTST cartridges returned to the typist to be reused.

When the output of one or more correction runs produced no discernible errors, the transcript image served as input to the text segmenting and labelling program described in D. Hays (1971), which produces a version of the transcript which we call a "basic text file." Unlike the transcript image file, which is no more than a long stream of characters divided only into lines (or computer records), the basic text file contains information which marks the boundaries of segments of the text (e.g., words, actor designations, sentence annotations), and identifies the kinds of segments and structures of segments which are present in the text. In performing this structural marking, the program relies on cues present naturally in the data, such as occurrence of punctuation marks, types of characters, and certain contextual cues, as contrasted with the fixed format positional cues common with the use of punchcards (where an item of data is identified as being one thing or another depending on which columns of the card it is punched in). The advantage of performing analyses on a BTF rather than a text image file is that segment identification does not have to be performed each time the text is analyzed. Further discussion of this program, and its use with transcripts of varying construction, is given in D. Hays (1971).

After identification of these units--transliterations of spoken words, sentences, actor designations, actor blocks, ordinary annotations, and systematic or labelled annotations (such as target identification)--parts of the text were automatically sorted by content in the manner described in D. Hays (1971) for the construction of inverted index files. For this paper, transliterations of spoken words were alphabetized and frequency counts made of them, for the entire transcript and according to the class of actor designation associated with the specific actor block in which a word occurred. Such processing involve the sorting of actor blocks according to actor designation, and generation of related frequency statistics. Other descriptive statistics, such as average

length in spoken words of actor blocks, were computed either from the basic text file or from the above automatic sorts. Additional computer processing for sequential phenomena will be described below.

Findings

Verbal Output

In a characterization of social behavior based on transcriptions of the behavior, the sheer output of verbalization, represented by word counts, can shed light on such issues as conversational dominance or in the case of classroom behavior, comparative student participation. For the fifteen classrooms examined here basic statistics for amount of verbal output from teachers and students are given in Figures 1, 2, and 3.

Figures 1 and 2 list for student and teacher utterances, respectively, the following information for a segment of each lesson: (a) number of words transcribed, (b) percentage of total output, in transliterations of spoken words, (c) number of distinct words used by students or by the teacher, (d) percentage of distinct words used (number of distinct words divided by total number of words uttered by students, or by the teacher), (e) the number of actor blocks associated with each, and (f) the average number of words in the actor blocks. With the exception of the last statistic, which was computed from full lesson transcripts when they were available, ten-minute segments of the lessons were used for these figures.

Average verbal output statistics, by grade and by corpus, are given for student and teacher utterances in Table 3.

Amount spoken by students and teachers. The total number of words transcribed for the various ten-minute segments varied from around 800 to 1500 words, with the modal number in the 1200's. Total output, regardless of speaker category, did not appear to be systematically related to grade level or student

Lesson	Words Uttered	% Output	Distinct Words	%	Actor Blocks	Aver. Length
A (1B-FB)	53	5.7	31	58.7	37	1.83
B (1B-MB)	59	4	33	55.9	23	3.48
C (1B-FB)	192	16.1	87	45.3	31	6.29
D (1W-FW)	283	32	129	45.6	50	5.67
E (1W-FW)	495	36	209	42.2	55	9.00
F (6B-FB)	253	19.8	126	49.8	47	6.2
G (6B-FB)	85	8.8	54	63.5	26	3.6
H (6B-MB)	394	24.6	120	30.5	24	16.8
I (6W-FW)	801	55.4	28.4	35.5	29	27.8
J (6W-MW)	947	71.9	312	32.9	59	16.0
K (11B-FW)	803	59.2	230	28.6	35	20.4
L (11B-MW)	235	16.3	123	52.3	20	6.0
M (11B-FW)	242	24.7	124	51.2	37	6.4
N (11W-MW)	49	3.8	33	67.3	4	11.4
O (11W-FW)	93	6.4	74	79.6	25	3.7

Figure 1

Some Text Statistics for Student Utterances

NOTE: The entry in parentheses has, in sequence, the grade, color of class, sex of teacher, and color of teacher.

All statistics are from approximate ten-minute samples, except for the average length of actor blocks figures, which are computed from the entire lesson transcript, when available.

Lesson	Words Uttered	%	Distinct Words	%	Actor Blocks	Aver. Length
A (1B-FB)	852	92	224	26.3	46	20.5
B (1B-FB)	1119	92	227	20.3	38	36.1
C (1B-FB)	946	79.3	227	24.0	40	36.1
D (1W-FW)	589	66	266	39.7	62	9.5
E (1W-FW)	844	62	266	31.5	62	13.6
F (6B-FB)	1014	79.3	246	24.3	56	14.9
G (6B-FB)	844	86.9	245	29.0	45	31.1
H (6B-MB)	1206	75.4	367	30.4	27	44.7
I (6W-FW)	630	44	244	38.7	25	25.2
J (6W-MW)	368	27.9	185	50.3	15	24.5
K (11B-FW)	554	40.8	217	39.2	23	42.0
L (11B-MW)	1204	83.6	352	29.2	22	35.2
M (11B-FW)	733	75	233	31.8	39	27.2
N (11W-MW)	1249	93.6	414	29.5	5	241.8
O (11W-FW)	1361	96.1	402	33.1	27	50.4

Figure 2

Some Text Statistics for Teacher Utterances

Students

	Per Cent Output	Per Cent Distinct Words	Actor Block Length
1B	8.6	53.3	3.87
1W	34.0	43.9	7.34
6B	17.7	47.9	8.89
6W	63.2	34.2	26.9
11B	33.4	44.0	10.9
11W	5.1	73.5	7.6

Teachers

1B	87.8	23.5	30.9
1W	64.0	35.6	13.6
6B	80.5	27.9	30.2
6W	35.9	44.5	24.9
11B	69.8	33.4	34.8
11W	94.9	31.3	146.1

Figure 3

Average percentage of output, distinct words, and actor block length for student and teacher verbalizations, by grade and dominant class color.

composition, though it is possible that with more detailed information on timing, differences in rate of speech might be found and related to such variables as grade level, type of discourse (discussion vs. lecture) and teacher style.

Some trends may be discerned, however, from an examination of Figures 1-3 for percentage of output for teachers or for students speaking singly. With the exception of sixth grade middle-class lessons, teachers overall said far more than the students, usually more than twice as much and for eleventh grade middle-class lessons, over 18 times as much. Teachers did not always dominate the conversation (as in lessons, I, J, and K), but on the average for these data they accounted for over 70 per cent of the words said in the classroom.

Another trend noted was that students talked more relative to the teacher in later grades than they did in the early grades. Both middle-class and lower-class sixth grade students showed an increase from the first grade for percentage of words uttered. This increase continued in the eleventh grade for lower-class students in the sample, but decreased for the middle-class students. What may be reflected in this pattern is an increase of verbal sophistication with age, and increasing complexity of subject-matter with grade level. One interpretation of the findings for the eleventh grade classes may be that the students tackle more complicated subjects with more differentiated language, when they do talk, and thus take longer to say what they have to say. But for these data they don't get the opportunity to say much, especially during particular lecture presentation situations. It might be interesting to extrapolate from this to college classrooms, and muse on the probably very small percentage of student utterances, and their content.

Comparing Corpus Y and Corpus X lessons, it is seen that, for the first and sixth grades, students in predominately black classrooms spoke relatively less often than did students in predominately white classrooms. The reverse was found for output in words of black and white eleventh grade classrooms.

Length of utterances. The findings for total verbal output of the teacher and students are reinforced by the figures for average number of words in actor blocks associated with individual students or teachers. In general, not only did teachers say more overall, but they did so at sometimes great length before anyone else did. That is, actor blocks associated with teachers were longer on the average than those associated with students.

Trends observed above for total student output from grade to grade, and between lower-class and middle-class classrooms, also had analogues in data for actor block length. Student actor block length tended to increase with grade level for both Corpus X and Corpus Y classes, with the exception of eleventh grade Corpus Y lessons. Also, for first and sixth grade classes, Corpus X students had longer actor blocks than did Corpus Y students.

When these findings are considered in conjunction with the distribution of lengths of actor blocks for teachers, they are more meaningful. Teachers very rarely produced just one or two word utterances unless they were punctuating a long student response. The common pattern was for practically all the teacher utterance blocks to be fairly long. Examination of the transcripts indicates that teachers did sometimes interrupt students with a short comment, the student continuing thereafter, but that the teacher comment more often than not was quite lengthy, usually longer than the utterance interrupted. The one exception to this pattern in this sample was lesson C, a reading and discussion class, where the teacher had a fairly large number of one to three word blocks the content of which was corrections of misreadings by students.

The length in transcribed words of teacher actor blocks on the average also exhibited progressive increase from grade to grade. One might speculate therefore that actor block length is related somehow to language complexity, to attention span, and to the language-processing ability of the student (more generally, of the persons or group in a situation with the shortest attention span,

or least facile language-processing ability), though the relationship may not be direct. (A conversation between two people who do not understand each other's language very well is likely to contain short actor blocks, to suggest an extreme case, as are many interchanges between parents and very young children.)

Multi-person utterances. The last five columns of Figure 4 give for each lesson the number of actor blocks and amount of output, in transcribed words, due to multi-person utterances. Since their number was quite small, all multi-person responses were combined for this presentation. These included utterances made by teacher and class together, teacher and part of class, class alone (a judged majority of students speaking, either in unison, or asynchronously), and part of class (judged as less than a majority of students).

As might be expected, more multi-person responses occurred in the earlier grades than in the later grades, as measured either by total number of transcribed words, or by number of actor blocks. Although some decrease in average length of such actor blocks may be noted with increasing grade level, in most cases the multi-person utterances were very short. The average number of words ranged from 2.3 to 1, with the exception of lesson C, where the figure of 6.7 words is attributable mostly to unison responses of the class during a reading lesson. Indeed, it is in the nature of multi-person responses to be very short, unless the material is read or memorized, and recited or chanted. In some situations, even outside of church, of course, high uniformity of group response is generated from a set of constrained rules. For the classroom tapes an example of this occurred in a math lesson not analyzed here, where number sequences were chanted by the class. In the lessons examined for this paper however, group recitation was not practiced for lengthy material.

The percentage of multi-person actor blocks showed a pronounced decrease with increasing grade level. That there should be more such responses in the early grades fits in with our intuitive notions about how things are in elementary as contrasted with secondary classrooms; though there may be variation in the

	# Different Student Actors Identified	# Blocks from Unidentified Students	% Non-Teacher Blocks Unidentified	# Indistinguishable Stretches of Text	# Multi-Person Actor Blocks	% Multi-Person Actor Blocks	# Words in Multi-Person Utterances	% Words in Multi-Person Utterances	Aver. Length Multi-Person Blocks
A	14	7	18.9	2	9	9.7	21	2.2	2.3
B	13	9	39.1	10	18	22.8	28	2.3	1.6
C	7	7	22.6	2	7	8.9	55	4.4	7.9
D	9	24	48.0	13	5	4.3	8	.9	1.6
E	6	33	60.0	12	14	10.7	19	1.4	1.4
F	11	11	23.4	3	7	6.4	12	.9	1.7
G	8	13	50.0	6	20	21.9	42	4.3	2.1
H	4	20	83.3	4	0	0	0	0	0
I	7	6	20.7	4	1	1.8	1	.1	1
J	6	29	49.1	15	3	3.8	3	.2	1
K	6	15	42.8	12	0	0	0	0	-
L	5	8	40.0	19	1	2.3	1	<.1	1
M	4	31	83.7	14	3	3.8	3	.3	1
O	1	1	25.0	1	1	9.9	1	<.1	1
P	6	13	52.0	1	0	0	0	0	-

Figure 4

Statistics on Indistinguishable Data
and Multi-Person Utterances

interpretation of such differences. A similar lack of simple interpretation holds for the finding that for the first and sixth grade lessons, middle-class white transcripts contained fewer multi-person blocks than did lower-class black transcripts. One might argue that greater numbers of multi-person responses would indicate a teaching strategy that is more conservative, in that it is closer to historically earlier patterns of heavy reliance on group recitation. On the other hand, it might be that underlying the group responses are teaching tactics which have as their goal greater group involvement, and that these tactics are not a matter of teaching ideology but are adaptations to the needs of the students. (It is interesting incidentally that the one kind of classroom where group responses will be found with high probability at any grade level are language learning classes.)

Speaker diversity. In addition to knowing how many multi-person responses involving students occur it is of some interest to know how many students speak individually, how many times each speaks, and for how long. Distribution of utterances across actors is a basic fact about any social situation; it is of particular interest in classrooms because of student participation.

Unfortunately, it is difficult to tell from the data for these classes, just how many students participated, because of the large number of student actor blocks where the actor was not identified. Table 4 shows that percentages of student actor blocks where the student was not identified range from 19 to 83%. It would appear at first glance that in the lower grades there is more speaker diversity in lower-class than middle-class transcripts (informally one has this impression when studying the transcripts), but this is not certain. What is clear from the transcripts is that, even though apparently some efforts were made to obtain seating charts and tapes were scrutinized at some tedious length for speaker identification, a student had little chance of being identified

if his name was not called by the teacher. H. Hays (1971) has an extensive discussion of problems in identifying speakers in data of this sort.

Lexical diversity. Some findings are presented on lexical diversity--that is, the proportion of distinct words used--again, in Figures 1 through 3. These percentages must be interpreted with caution, since this index, or type-token ratio, is sensitive to total number of words. That is, in general, the longer the text, the lower the ratio. Taking this into consideration, however, it appears to be a fair interpretation that teaching for first and sixth grades, teachers in the lower-class classrooms exhibited less lexical diversity than their counterparts in middle-class ones. This is interesting in relation to the fact that in these classes, some evidence for greater language complexity in middle-class white students was inferred from the relative length of utterances. The lexical diversity figures give some indication that the teachers are exhibiting less complex language behavior, in a certain sense. Both these interpretations, however, are tentative and should be bolstered (or modified) by closer examination of the language used--though it is difficult to imagine that anyone is likely to say anything very complex in actor blocks averaging 2.3 and 1.6 words (lessons A and B).

Sequential Phenomena

Data such as those presented above concerning relatively how often various actors in a situation speak, how much they speak, and so on, can provide some information about basic facts of the interaction. However, none of these are based on truly sequential properties of the dialogue, that is, to say, patterns of the flow of communication from one speaker to another.

Indeed, much of what is called interaction analysis, communications or discourse analysis, is in fact based on data summaries of the first sort, where attributes of individual utterances, sentences, phrases, or words, are tabulated over a discourse or interaction record, extracted from their embeddedness in sequences.

In this section, findings for sequential properties of the classroom transcripts will be presented. These involve patterns of teacher and student interchange, and repetition of "content" words within actor block and across actor block spans of varying length. The analyses are all algorithmic, that is, they can be computed 'blindly' by computer on the textual input without recourse to human judgment during the analysis. Though only transcript data were used, the techniques are applicable as well to sequences involving judgmental data, such as reconstructed text which has been marked for anaphora resolution and semantic judgments.

Four first grade lessons, two from lower-class black (A and C), two from middle-class white classrooms (D and E) were focussed on for this more refined treatment, though a few results are reported for the other transcripts.

Patterns of actor interchange. The complexity of the language used by a set of speakers, as inferred from lexical attributes or characteristics of the syntax of sentences, is not necessarily related to the complexity of the patterns of communicative interchange. If as a first step an interactive discourse is viewed simply as a sequence of utterances, apart from content, where each utterance is associated with an actor (or several actors in the case of group responses), it will be seen that discourses differ in patterns of actor sequencing.

In processing the classroom materials relative to this problem, one computer program was constructed to divide each transcript into spans of actor blocks starting with a teacher utterance and to tabulate the distribution of length of these spans (here referred to as T-O spans, for "teacher-other spans"). This kind of division is convenient for many kinds of classroom interaction, since the teacher not only speaks frequently but also often exercises considerable control over the interaction. (It might not be particularly helpful for a student-led discussion session, needless to say.)

T-O span information is given in the top half of Figure 5. Note that average length of T-O spans did not differ markedly from grade to grade. This finding is not surprising in view of the overall high frequency of teacher utterances in these transcripts. Indeed, the large majority of T-O spans were two actor blocks long, consisting of a teacher utterance followed by only one student utterance before the next teacher utterance cycle.

Some differences were found in Corpus X and Y comparisons: Average length of T-O spans differed slightly for both the first (2.06 for Corpus Y vs. 2.28 for Corpus X) and the sixth (2.12 vs. 3.87) grades. If we examine the percentage of actor blocks which are in T-O spans greater than length 2, the findings are fairly pronounced. For first grade transcripts, 9.1% of the Corpus Y actor blocks occurred in T-O spans greater than length 2 as contrasted with 28.7% for Corpus X. In sixth grade transcripts, the corresponding percentages were 14.2% and 61.2%, respectively. That is, for both first and sixth grade lessons, more student responses occurred between teacher utterances in the middle-class white classrooms than in the lower-class black classrooms.

The four first grade transcripts A, C, D, and E were divided into spans containing any repetition of a student speaker from one to three actor blocks away. Under this definition of "span," exchanges between the teacher and one student are included which may encompass a number of T-O blocks; they may also include sequences 'linked' by the occurrences of nearby comments by the same students. The choice of 3 as the cut-point for actor-block distance was arbitrary, though a trial run with the value of 4 did not affect the results markedly, and larger values seemed to take in too much, by including obvious subject-matter changes within the spans.

Data for these spans are summarized in the lower part of Figure 5. Average length of the spans was greater for Corpus X transcripts (3.35) than

	First					Sixth					Eleventh				
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
# Aver. Lnth. T-Other Spans	2.07	2.05	2.07	2.17	2.38	2.24	2.07	2.04	2.30	5.43	2.14	2.19	2.39	2.00	2.00
Total #	85	78	104	47	50	212	68	23	23	14	101	154	126	4	23
% Actor Blocks in Spans >2	10.2	8.4	8.8	19.6	37.7	25.7	10.6	6.4	35.8	86.6	17.6	24.9	34.4	0.	0.
Distribution of Lengths	2-79 3-6	2-74 3-4	2-98 3-5 4-1	2-41 3-4 4-2	2-37 3-8 4-4 5-1	2-176 3-25 4-10 7-1	2-63 3-5	2-22 3-1	2-17 3-5 4-1	2-5 3-2 5-1 6-1 7-2 8-1 13-1 14-1	2-89 3-10 4-2	2-127 3-25 4-1 5-1	2-98 3-18 4-6 5-1 6-1 7-2	2-4	2-23

	A	B	D	E
Aver. Lnth. Spans with any Actor Repetition	2.51	2.23	3.29	3.40
Total #	70	64	31	35
% Actor Blocks in Spans >2	37.5	48.9	49.0	57.1
Distribution of Lengths	2-55 3-4 4-6 5-1 6-3 7-1	2-49 3-1 4-9 5-2 6-1 7-1 8-1	2-22 3-3 4-1 6-3 9-1 10-1	2-22 3-5 4-3 5-1 6-1 7-2 16-1

Figure 5

Spans of Actor Blocks Based on Actor Recurrence

for Corpus Y (2.37). The percentage of actor blocks in such spans greater than two actor blocks in length was also greater for Corpus X (53.1) than for Corpus Y (43.2), though the difference was not so great as for the comparable figures for T-O spans. In other words, the length of actor block sequences involving repeated participation by students was greater for Corpus X than for Corpus Y lessons which were examined. If we take these figures as rough measures of interactive complexity, the interpretation is that the middle-class lessons showed somewhat more interactive complexity than did the lower-class lessons.

Patterns of lexical repetition. With reference to examining distribution of meaning across utterances, repetition of 'content' words within and between nearby actor blocks was examined. Because meaning is communicated via potentially complicated structures in ways that are not entirely understood, this analysis was in no way expected to give a comprehensive picture of sequential patterns of content. However, the repetition patterns only of explicit words gives information that is different from that obtainable from inventories of words and their proform surrogates, semantic features, "basic ideas," or the like. That a word is repeated explicitly by one actor or the next is interesting, in light of the fact that the actor usually has the option of using a pronoun, synonym, or other indirect reference. Note that the algorithmic involved in this analysis is straightforward, and applicable as well to text which has been marked for proform substitution, lexical identity, semantic features, and similar attributes.

For purposes of the analysis, "content word" was defined as any word which was not a "function word," in turn defined with a very liberal set of specifications. Not only all articles, conjunctions, and prepositions counted as function words, but also all pronouns, verbs which can function as auxiliary verbs, interjections, common intensifiers and quantifiers ("very," "every"), pause fillers ("ah," "uh"), and some words which may not be classified ordinarily as pronouns, but which usually serve to give indefinite reference ("thing," "something"). For purposes

of identifying repetitions, a set of morphological analysis heuristics were applied. Content words were counted as the same if they differed only by the addition or deletion of the suffixes -s, -es, -ies, -ing, -ed, -en, -ly, -ily, -y, or were examples of a small list of common verbs which have interval spelling differences in their various forms ("took," "take"). Prefixes were not examined, since it was felt that in a certain sense, prefixes are more likely to "change the meaning" of a form more than are suffixes.

Repetitions of content words in the sense described above were identified within actor blocks, and across nearby actor blocks, for the first 750 words of transcripts A, C, D, and E. Information on actors associated with the blocks involving a repetition was maintained. A word repetition-span was defined as a maximal sequence of repetitions of a single content word across more than one actor block, where no more than two intervening actor blocks did not contain the word. More than one word might be repeated across some of the actor blocks involved in a repetition span, in this case, more than one repetition span was identified for purposes of analysis.

Findings for word repetition-spans not including spans in which the word was repeated by only one actor are given in Figure 6. Single-actor repetitions across blocks were omitted because of an interest in interactive repetition. More such repetition-spans occurred in Corpus Y lessons than in Corpus X lessons, with means of 19 vs. 24.5. If the frequencies are divided by the number of actor blocks in the text segments analyzed, the figures are .16 vs. .32, respectively. That is, using either total output in spoken words or number of actor blocks over which the words might be distributed as a basis of comparison, more repetition by different actors of content words across nearby actor blocks was found for Corpus Y than for Corpus X first grade transcripts.

	Lesson			
	A	B	D	E
1. Word Repetition-Spans over Actor Blocks*	25	24	16	22
2. # Repetition-Spans Initiated by Student	19	21	12	16
3. # Repetition-Spans Initiated by Teacher	5	3	3	6
4. Student-Initiated Repetition-Spans with Word Repeated by Teacher more than once	17	11	2	2
5. Average Length of >1 Repetition in 4	2.35	3.36	2.0	2.5
6. Teacher Initiated Repetition-Spans with Word Repeated more than once by Student	0	0	1	0
7. Average Length of >1 Repetition in 6	-	-	2.0	-

*Number of occurrences of repetition of a non-function word in actor blocks not farther than two actor blocks from each other. If a word has multiple repetitions across a number of actor blocks not farther than two away, at any point, the whole span of blocks counts as one occurrence. Repetitions by only one actor are not counted.

Figure 6

Repetition of Non-Function Words Across Actor Blocks, in Four First Grade Lesson Segments

The same finding held for spans involving repetition of a content word by only one actor (item 3, Figure 8).

Of the 'interactive' repetition-spans summarized in Figure 6, around three-quarters of the spans were initiated by a student actor block, with somewhat more for Corpus Y transcripts (82 per cent) than for Corpus X transcripts (74 per cent). In practically all these cases, when a student said the word first, it was then repeated almost immediately by the teacher, rather than being repeated by another student, in some cases, other students repeated the word after the teacher had said it (for lesson A, 3 occurrences; C, 0; D, 2, and F, 3). The very small number of words uttered by a teacher which then any student repeated explicitly may seem surprising, even if one does not expect rote drill ("Now, say after me....") to be a common teaching technique. That a word is not repeated does not of course mean that it was not understood, or even repeated internally by the student, or referred to indirectly in a spoken comment.

That words spoken by students were often repeated by the teacher, in all four classrooms, perhaps indicates a verbal reinforcement tactic by the teacher. An informal examination of the transcripts showed that often the repeated word had apparently been elicited by some demand of the teacher--a direct question, a 'fill-in-the-blanks' type statement, etc.--and the word that the teacher repeated often seemed to fit into some outline of subject matter for the lesson. It is interesting however, that so frequently the teacher did not himself utter the word, beforehand, but apparently aimed at retrieval by the student from his everyday experiences, his readings, a previous day's lesson, and not from memory for what was recently said.

Corpus X and Y transcripts did not differ markedly in the average length, in actor blocks, of interactive repetition-spans, with or without counting actor blocks in which no repetition occurred (items 1 and 2, Figure 8).

Differences were found, however, in the number of times that words were repeated by the teacher, within one block, across several blocks, and regardless of whether or not the teacher said the word first. For interactive repetition-spans initiated by a student, teachers in Corpus Y classes repeated the word more than once in 57 per cent of the cases, as contrasted with 11 per cent for Corpus X teachers. The average lengths of these repetitions were 2.85 times and 2.25 times, respectively. In non-interactive spans involving teachers (Figure 8, item 4), mean length of repetition was 4.42 for Corpus Y and 2.38 for Corpus X. Considering word-repetition strictly within actor blocks, apart from whether or not the blocks entered into any repetition-span (Figure 7), it was found that there were more occurrences of word-repetition within single actor blocks by teachers in Corpus Y classes than in Corpus X classes, with means of 48 and 12 blocks, respectively; that the average length of repetition within blocks was longer (2.64 times vs. 2.15 times); and the proportion of such actor blocks involving occurrence of the word at least three times was .38 for the two Corpus Y first grade transcripts, and .15 for the two Corpus X transcripts analyzed. All the above indexes show that in the segments of the four first grade social studies lessons analyzed, teachers in Corpus Y classrooms repeated more content words more often than did their counterparts in the Corpus X classrooms.

Given that the above analysis dealt only with explicit repetitions of the content words, with pronouns and other common surrogate forms omitted, it might be inferred that the teachers in the black lower-class lessons were taking pains to be clear about lexical items. Just why so much repeated explicitness by Corpus Y teachers relative to Corpus X teachers, was found is not entirely clear. One may speculate that it indicates an adaptive response of the teachers to vocabulary, or other language skills of the students, or

		Lesson			
		A	B	D	E
Occurrences of Repeated Word within Actor Block	S	0	1	2	1
	T	44	53	6	17
Average Length of Repetition	S	-	2	2	2
	T	2.43	2.77	2.17	2.12
# Occurrences of Word Repeated More than Once in Block	S	0	0	0	0
	T	11 (.25)	26 (.5)	1 (.17)	2 (.12)

Figure 7

Occurrences of Repetition of Non-Function Words within Actor Blocks, for Four First-Grade Social Studies Lessons (Ten-Minute Segments)

		Lesson			
		A	B	D	E
1. Aver. # of Actor Blocks in Repetition-Spans		3.28	2.87	2.31	3.64
2. Aver. # of Actor Blocks in "Squeezed" Repetition-Spans		2.96	2.42	2.19	2.64
	"Fat" Factor	8	11	2	22
3. # Spans where only one Actor said Repeated Word	S	2	0	2	0
	T	8	12	1	4
4. Aver. # of Word-Repetitions in One-Actor Spans (3.)	S	4.00	-	2.00	-
	T	4.50	4.33	2.00	2.75

Figure 8

Additional Data on Repetition-Spans for Four First-Grade Lessons

familiarity with items of a particular subculture. However, it is entirely possible that some difference in teacher training or individual preference for teaching styles or anticipation of student capabilities may be involved.

Summary of Findings

In the figures obtained for verbal participation by students and teachers in transcripts of lessons from the 15 first, sixth, and eleventh grade lower-class black and middle-class white classrooms, differences were found both with respect to grade level and to dominant color of classroom members.

Grade level. In examining the statistics for verbal output by grade level, it was seen that in these lessons:

1. While by far the largest part of what was said during these lessons was said by the teachers, the amount spoken by students increased from the first grade to the sixth grade, but decreased from the sixth grade to the eleventh grade, on the average.

2. Further, while teachers generally also spoke at greater length when they 'held the floor' than did students, the average length of individual student utterances increased from the first to the sixth grades, with some decrease in length from the sixth grade to the eleventh grade.

3. The percentage and length of group responses, where more than one student was speaking, decreased with increasing grade level, though overall, very few such responses occurred in these lessons.

The first two findings above did not hold for differences between sixth and eleventh grades in lesson transcripts from the predominantly black classes, where both amount of verbalization and utterance length showed a consistent increase from grade to grade.

Class composition. In comparing these figures within grade level between lessons with predominantly white middle-class and predominantly black lower-class participants, the following trends were noted:

1. Students in first and sixth grade lower-class lessons said less overall, and had shorter utterances than did students for those grades in middle-class lessons. Utterance length was notably very short for first grade black students.

2. In contrast, during these lessons black eleventh grade students said more and at greater length than did the white eleventh grade students.

3. For first and sixth grades, fewer multi-person responses occurred in the middle-class lessons than in the lower-class ones.

4. Again, in the first two grade levels, teachers in the lower-class classrooms showed less lexical diversity than teachers in corresponding middle-class classrooms.

It seems clear from the above findings that neither grade level nor class composition alone provided results as revealing as those from the examination of composition differences within grade level. That, composition differences were similar for the first and sixth grades, but showed little continuity of findings into the eleventh grade, supports assumptions expressed in the beginning of the paper.

Sequential patterns. The above findings provided information about some basic properties of the interaction in those lessons examined, without examining truly sequential aspects of the data. Analyses of a much finer-grained nature were performed additionally, however, on four first-grade transcripts, to examine just such sequential patterns. It was found from these that:

1. The length of actor block sequences involving repeated participation by various students (as contrasted with a frequently

found pattern of teacher utterance, one student utterance, teacher utterance, student utterance, etc.) was greater for the middle-class lessons than the lower-class lessons.

This finding was interpreted as indicating more interactive complexity in the two white classrooms than the two black first grade classrooms examined. Similar results were found in comparisons among sixth grade lessons.

Repetition of lexical items within and across actor blocks was examined also, for varying length spans of such repetition. It was found that:

1. Teachers in the two lower-class classrooms repeated words more often within the same actor block than did teachers in the middle-class lessons.

2. Teachers repeated words more often <u>across</u> blocks, and across <u>more</u> actor blocks in the black classrooms than in the white first grade classrooms.

This repetition of words by teachers in the black lower-class lessons was quite marked; and the fact that the words themselves were repeated rather than indicated by pronouns or other indirect forms was deemed interesting.

Another finding was:

3. In all four classrooms, students frequently initiated repetition patterns, whereas it was uncommon for teachers to say a 'content' word which any student repeated immediately.

In examining the transcripts more closely, teachers seemed both to (a) use 'fill-in-the-blanks' tactics with the students for content words which were significant for the lesson, without giving direct hints, and (b) to 'reinforce' the student use of such a word, by repeating it immediately (and, for the two dominantly lower-class black lessons, repeating it again and again).

Discussion

Some cautions. Although we have frequently spoken of "black" and "white", "lower-class" and "middle-class" for brevity, the extent to which we would wish to generalize from the findings reported in this paper to other classrooms (or other kinds of situations). The extent to which these lessons are representative, and of exactly what, is a matter of conjecture, though the findings are suggestive.

Another area of caution for these data, and for similar data used by other investigators, has to do with accuracy. Although interjudge consistency checks are routinely made for judgments based on interpretations of transcripts, it seems not to be generally recognized that the preparation of transcripts in the first place involves judgments as well, and is open to variation among transcribers, either because of differences in what was perceptually constructed, or because of different translation conventions from spoken to written forms (H. Hays, 1970,1971). Even with transcript data edited as heavily as that used for this study, it is known that some residual inaccuracies exist.

Student responses are especially open to variations in interpretation, because of the acoustical problems of recording in the classroom. (Some are likely to have been missed entirely.) For some purposes, such as tabulation of relative amount of speaking by students and teacher, this error variance is probably not important, but in other cases, especially those involving very fine-grained analysis of patterns of lexical items, some uncertainty is introduced into the results.

Uncertainties in speaker identification and judgment of sentence boundaries has been discussed earlier.

In many cases, these variations should not substantively affect the conclusions drawn, but that they exist should be kept in mind. In general, our experience with these problems suggests that results of any study which,

unlike the present one, relies on unedited transcript data, should be taken with a grain of salt.

Transcriptions and reconstructions. Analyses reported in this paper were all straightforward and performed on transcriptions of manifest verbal behavior, without information on underlying grammatical structures. It should be clear that even without "reconstruction" or some other kind of grammatical and semantic pre-processing, helpful information can be obtained from 'surface' descriptions of verbal interchange; though it should be equally clear that some questions are more easily answered with 'deeper' analyses.

There are several reasons an investigator may wish to work with transcription data. One practical reason is cost: even though the preparation of a reasonably accurate transcript is costly enough, reconstructions or yet more refined treatments are very costly indeed. A related reason is that transcriptions are usually prepared before grammatical representations, and may be used for preliminary analyses related to questions which are better answered by reconstructed text analysis (for semantic questions, suggestive results may be obtained through automatic "content analysis").

Apart from time and cost, an investigator may choose to examine transcriptions because he is interested in surface characteristics of discourse. The flow of communication from one person to another, patterns of directedness of the communications, the pacing and other sequential properties of the behaviors--these are to some extent separable from the syntax and semantics of the sentences which are uttered, and to some extent the surface structure of the discourse interacts with the underlying meanings. Thus, analyses of transcriptions and reconstructions may be seen as complementary.

With respect to the particular findings of this paper and those of the series of "reconstruction" papers referenced earlier, there are several instances where the findings of one complement or qualify the findings of the other.

For instance, the finding of a very small amount of verbal output for students in the first and sixth grades, especially for black lower-class, should be seen as qualifying the results reported for characteristics of sentences and lexical items in the reconstruction papers. The finding reported in Loflin et al. (1971) for greater amount of conjoining and adjoining linkages for white students than black students in the first grade are more easily understandable when the extremely short utterance length for first-grade black students is considered. These students seldom said anything long enough for either kind of linkage to be likely to occur.

Similarly, the findings reported in Guyette et al. (1971) for greater implicitness of lexical category and proform usage in black than white elementary lessons are complementary to the findings reported here for lengthier repetitions of content words in black than white first and sixth grade lessons. Taken alone, either would be misleading. The first would suggest that the language in the black lessons was more indirect; the second, that the language was more explicit. What appears to have been the case is that teachers in the lower-class lessons simply dwelt on the same subjects longer, using both explicit and implicit verbal devices.

Social class and color. Perhaps the most suggestive of the findings given above--though they must be regarded as no more than suggestive because of sampling considerations--are those for differences between the predominately black lower-class and the predominately white middle-class lessons, in the elementary grades. The black students said few words, in short stretches, within the framework of simpler patterns of interchange; whereas the white students said more, at greater length, in more complicated interaction patterns. Findings for sequences of repetition of 'content' words, and lexical diversity statistics for elementary teachers complement these findings for student responses. One might summarize this by saying that the black elementary students were less 'verbal',

in certain senses, than their white counterparts, during the lessons examined; and that correspondingly the teachers in the black classrooms exhibited generally 'simpler' language behavior.

What underlies these observations? Is it in fact the case that the black students were less verbally skillful, or simply less attuned to the particular language of the classroom? Could it have been, on the other hand, that they were either not expected or 'motivated' to participate in the ways that the white students were?

Social class differences in language behavior have been reported by a number of investigators (e.g., Cazden, 1966; Hess & Shipman, 1965; Lawton, 1963). Their findings fairly consistently show shorter utterances for lower-class than middle-class children; and often indicate less structural complexity. The verbal output figures reported here are consistent with the earlier findings; and those results which have been reported from these data which bear on grammatical complexity (Guyette et al., 1971; Loflin et al., 1971) more often than not (but not overwhelmingly) support the earlier findings, for younger informants. It is not clear, however, that either dialectal differences nor the social circumstances of data-gathering were adequately taken into account in the earlier work. Especially in those studies where ethnic differences were involved, it seems likely that the presence of a middle-class white investigator in an institutional setting may well have affected what was spoken or written by the subjects. In contrast, when reading portions of narratives and playground conversation of children of ethnic minorities recorded by Labov and his colleagues (e.g. Labov & Waletsky, 1967), one gets the impression neither of taciturnity nor of marked structural restrictedness.

In reflecting upon observed differences in verbal behavior in the elementary school lessons in this sample, we have been curious about the following matters (among others):

(1) the 'base-line' preference or facility of the student informants for more or less extended discourse, and for varying sorts of more or less 'complex' constructions,

(2) the extent to which the language of the classroom constitutes an unfamiliar register or dialect,

(3) the effect of subject-matter familiarity, and interest in relation to the language variables.

In the absence of data on these background matters, one may only speculate; though characteristics of the language behavior in these situations seem reasonably clear. Impressionistically, the language spoken in all the classrooms examined here was very middle-class middle American 'white', at least during the formal lessons, and we way suppose that strong norms exist for speaking 'properly', that is, in the dialect of the classroom. But the extent to which dialectal familiarity may be related to verbal output is not certain, since familiarity with the subject-matter and other variables may play a role as well.

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